

Features

- Advanced high cell density Trench technology
- Improved dv/dt capability
- Fast switching
- Green Device Available
- Suit for -1.5V Gate Drive Applications

Product Summary



V_{DS}	-20	V
I_D	-400	mA
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	600	m Ω

Applications

- Notebook
- Load Switch
- Battery Protection



Absolute Maximum Ratings($T_C=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current ¹	I_D	-400	mA
Pulsed Drain Current ²	I_{DM}	-1.6	A
Total Power Dissipation ³	P_D	312	mW
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}C$
Operating Junction Temperature Range	T_J	-55 to 150	$^{\circ}C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	---	400	$^{\circ}C/W$

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-20	---	---	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-0.3A	---	440	600	mΩ
		V _{GS} =-2.5V, I _D =-0.2A	---	610	850	mΩ
		V _{GS} =-1.8V, I _D =-0.1A	---	810	1200	mΩ
		V _{GS} =-1.5V, I _D =-0.1A	---	1020	1600	mΩ
		V _{GS} =-1.2V, I _D =-0.1A	---	1800	3000	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-0.3	-0.6	-1.0	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V	---	---	-1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±8V, V _{DS} =0V	---	---	±20	uA
Total Gate Charge	Q _g	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-0.2A	---	1	---	nC
Gate-Source Charge	Q _{gs}		---	0.28	---	
Gate-Drain Charge	Q _{gd}		---	0.18	---	
Turn-On Delay Time	T _{d(on)}	V _{DD} =-10V, V _{GS} =-4.5V, R _G =10Ω, I _D =-0.2A	---	8	---	ns
Rise Time	T _r		---	5.2	---	
Turn-Off Delay Time	T _{d(off)}		---	30	---	
Fall Time	T _f		---	18	---	
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, f=1MHz	---	40	---	pF
Output Capacitance	C _{oss}		---	15	---	
Reverse Transfer Capacitance	C _{rss}		---	6	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ¹	I _S	V _G =V _D =0V, Force Current	---	---	-0.4	A
Pulsed Source Current	I _{SM}		---	---	-0.8	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-0.2A, T _J =25°C	---	---	-1	V

Note:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature

Typical Characteristics

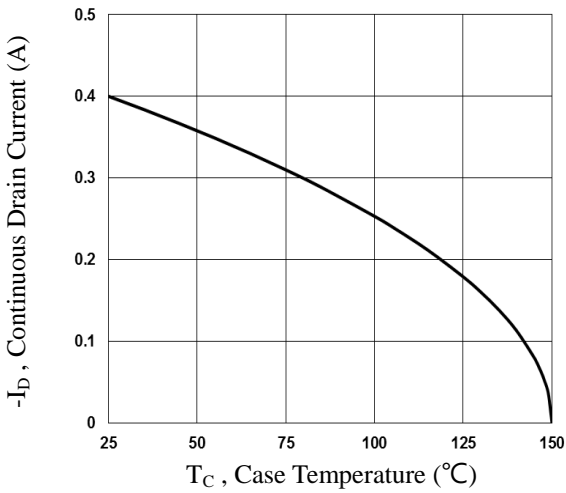


Fig.1 Continuous Drain Current vs. T_c

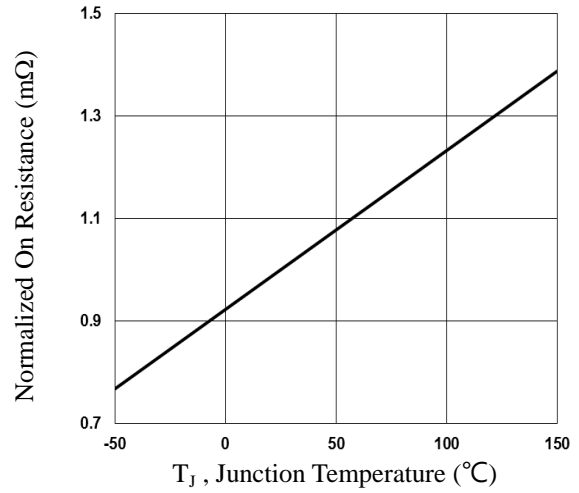


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

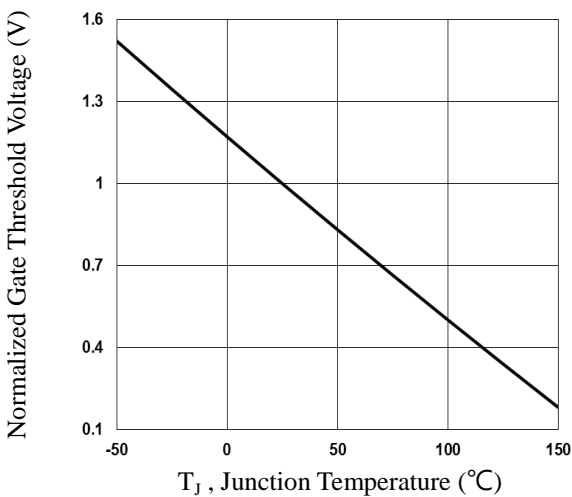


Fig.3 Normalized V_{th} vs. T_j

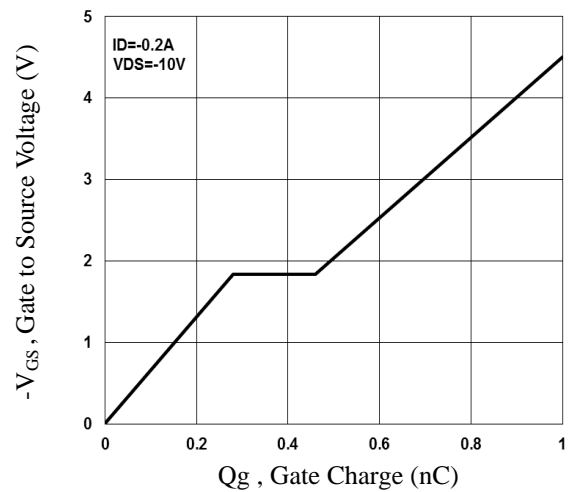


Fig.4 Gate Charge Waveform

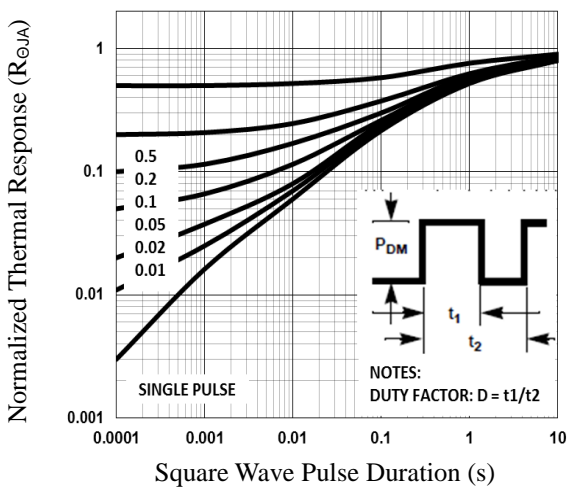


Fig.5 Normalized Transient Response

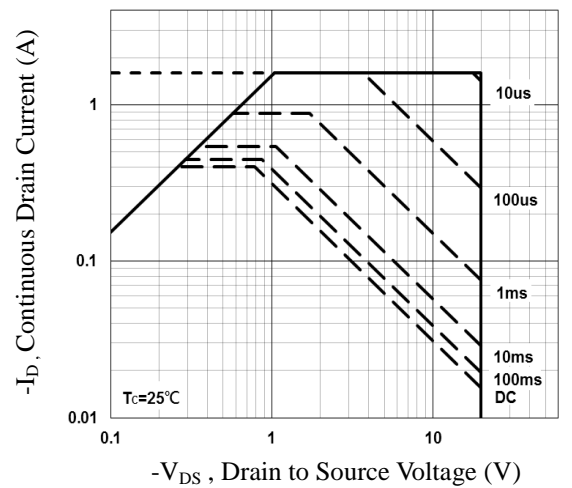


Fig.6 Maximum Safe Operation Area

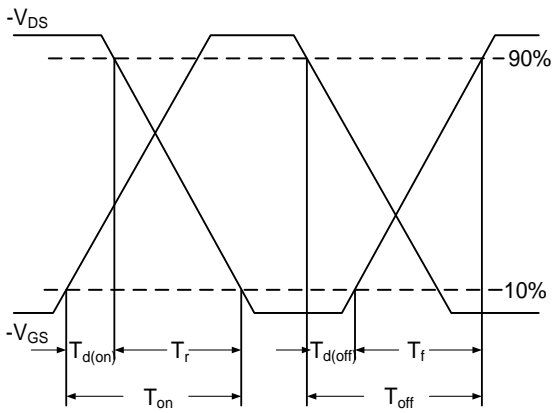


Fig.7 Switching Time Waveform

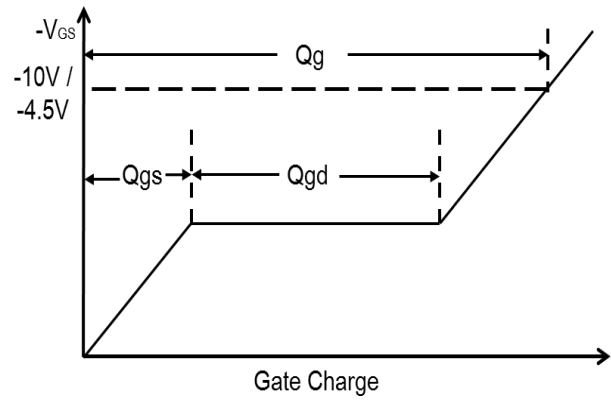
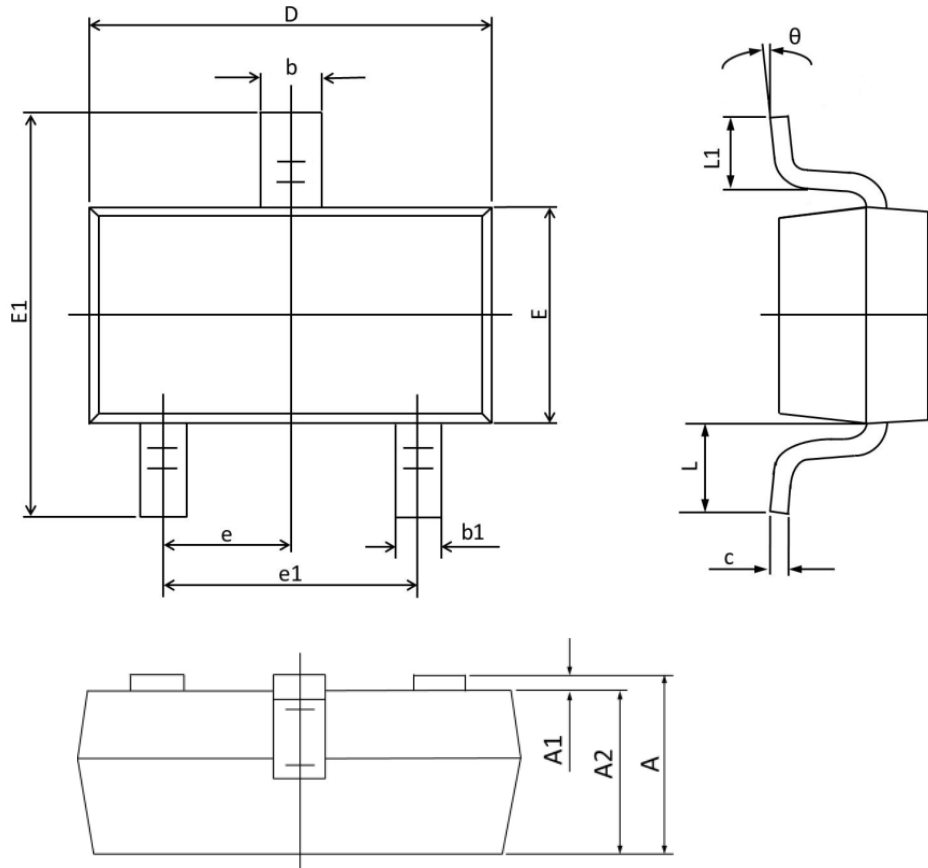


Fig.8 Gate Charge Waveform

SOT523 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.70	0.80	0.90	E	0.70	0.80	0.90
A1	0.00	---	0.10	E1	1.40	1.60	1.75
A2	0.70	0.75	0.80	e	0.50 REF		
b	0.25	0.30	0.35	e1	0.90	1.00	1.10
b1	0.15	0.20	0.25	L	0.30	0.36	0.48
c	0.10	0.15	0.20	L1	0.26	0.36	0.46
D	1.50	1.60	1.75	θ	0°		8°